In the claims:

Please amend the claims as follows:

1. (Currently Amended) A fiber optic sensor for detecting a change in displacement due to mechanical, thermal or other conditions, the fiber optic sensor comprising:

a lead fiber having a first end with a connector for connecting the lead fiber to an interferometric demodulation instrument and a second end having a first ferrule with a partially reflective surface having a reflectivity of approximately 3%;

a sensor fiber having a first end with a partially reflective surface and a second end having a second ferrule with a partially reflective surface having a reflectivity of approximately 24%, the sensor fiber having an optical path length which varies in accordance with the change in displacement; and

a sleeve for connecting the second end of the lead fiber to the second end of the sensor fiber so as to leave a gap between the partially reflective surfaces of the first and second ferrules, the gap being adjusted between 25-200 microns to provide an optimal light signal to the instrument such that the light returned to the instrument by all reflecting elements is of equal intensity to maximize an interferometric signal.

2. (Previously Presented) The fiber optic sensor of claim 1, wherein the sensor fiber is configured with at least one optical path length and a configuration for measuring at least one said change in displacement.

3-4. (Canceled)

5. (Previously Presented) The fiber optic sensor of claim 2, wherein the sensor fiber has a length of less than 10 cm.

6. (Previously Presented) The fiber optic sensor of claim 2, wherein the sensor fiber has a length of greater than 100 m.

7. (Currently Amended) The fiber optic sensor of claim 2, comprising a plurality of the sensor fibers, wherein the connector connects the second end of the lead fiber to the first end of each of the plurality of the sensor fibers in parallel.

8. (Original) The fiber optic sensor of claim 7, wherein the connector connects the second end of the lead fiber to the first end of each of the plurality of the sensor fibers at a single location on the lead fiber.

9. (Original) The fiber optic sensor of claim 8, wherein the plurality of sensor fibers have different optical path lengths.

10. (Previously Presented) The fiber optic sensor of claim 2, further comprising a plurality of additional sensor fibers connected to the lead fiber at locations between the first and second ends of the lead fiber.

11. (Previously Presented) The fiber optic sensor of claim 2, wherein the at least one change in displacement is due to pre-buckling, buckling, cracks, leaks, or creep.